2011 Wyoming Grizzly Bear Job Completion Report

Wyoming Game and Fish Department
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INTRODUCTION

This completion report summarizes 2011 grizzly bear work items completed by the Wyoming Game and Fish Department's (Department) Large Carnivore Section and regional personnel. In the past, this information was included in multiple reports not readily available to agency personnel, the legislature, or the public. This report allows the Department to present information pertaining to grizzly bears in Wyoming in one document and make it available to all interested parties.

GRIZZLY BEAR POPULATION MONITORING

2011 Wyoming Game and Fish Department (WGFD)
Grizzly Bear Population Monitoring Trapping Summary

Background

Annual trapping of grizzly bears has traditionally been labeled as "research" even though it should be considered part of an annual monitoring that must be completed to adequately manage grizzly bears. This activity is not dissimilar to annual monitoring the Department completes to manage other species of big game. In addition, grizzly bear data collected during annual monitoring activities have been used for various research projects.

Population demographics data obtained from captured grizzly bears and radio collar data are a vital components of the overall monitoring program for this species. This information provides survival data by sex and age to assure that we can accurately monitor mortality thresholds that must be maintained per our commitment under the Final Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Area (GYA) of 2007. Survival estimates are a significant parameter to monitor each year, as trends drive trajectory of the population.

One of the goals of the annual capture effort is to assist the Interagency Grizzly Bear Study Team (IGBST) is to keep approximately 25 females radio-collared across the GYA. This assures that the Department personnel can accurately monitor survival rates representative of the entire ecosystem. The Department's commitment in this effort is to maintain approximately 10 radio-marked females that spatially represent distribution of females in Wyoming's portion of the ecosystem.

Meeteetse

Trapping in the Timber Creek, Dick Creek, and Franc's Fork drainages was initiated on June 13 due to late spring snow. Six trap sites (3 culverts and 3 snare sets) were set in Franc's Fork, the West Fork of Timber Creek, Timber Creek, the Timber Creek/Dick Creek divide, South Fork of Dick Creek, and Dick Creek and ran through June 27. The Department personnel pulled all trapping area closure signs on June 30 following completion of the capture effort.

Four grizzly bears were captured and 1 was radio collared. They are as follows:

- G168, 6/20/11, South Fork Dick Creek, subadult male, tags and samples, uncollared.
- G169, 6/21/11, Franc's Fork, subadult male, tags and samples, uncollared.
- G170, 6/26/11, Dick Creek, subadult male, tags and samples, uncollared.
- GB675, 6/27/11, Franc's Fork, adult male, tags and samples, VHF transmitter.

Blackrock/Fox Park

In July and early-August, trapping operations were conducted to monitor population demographics and effects of whitebark pine loss on grizzly bears in the Blackrock and Fox Park areas of the Greater Yellowstone Ecosystem (GYE). One of the main arguments used by groups opposed to delisting of the grizzly bear is that wildlife managers cannot be sure that the grizzly population will not experience a decline due to the loss of whitebark pine, which is a key food source in the GYE. In order to address this issue, the Large Carnivore Section conducted efforts to radio collar grizzly bears in areas where whitebark pine occurs, but has seen dramatic declines in the past 5+ years due to infestations of mountain pine beetles. Large Carnivore Section personnel can now compare survival, habitat use, distribution, and movements of bears collared in 2011 with those of the grizzly bears collared prior to the whitebark pine die-off.

Blackrock

The Blackrock area of the Bridger-Teton National Forest near Moran Junction was previously trapped in 2000, 2002, and 2005 including a livestock depredation study in the mid-1990's. Trapping efforts were initiated on July 7, 2011 in this area. Nine trap sites (5 culverts and 4 snares) were set in Mary's Lake, North Fork Spread Creek, Grizzly Creek, Game Creek, Moosehorn Flats, Kettle Creek, Lower Kettle Creek, Grouse Creek, and Skull Creek. All traps, all baits, scent lures, and other equipment were removed from these sites by July 22. Trapping area closure signs were left in place until August 9, when all were removed. The Buffalo Ranger District of the U.S. Forest Service (USFS) allowed the Department to close several forest roads to discourage public access to trap sites and federal personnel were very helpful in providing housing and other assistance. Three grizzly bears were captured and radio collars were placed on 2 of them:

- GB 671, 7/9/11, Moosehorn Flats, adult male, tags and samples, VHF transmitter.
- GB 678, 7/9/11, Grizzly Creek, adult female, tags and samples, GPS transmitter.
- G171, 7/18/11, Moosehorn Flats, subadult male, tags and samples, uncollared.

Fox Park

The Fox Park area of the Bridger-Teton National Forest was previously trapped in 2001. Trapping efforts were initiated on July 28, 2011 in this area. Four snares were set in Upper Snake, Mink Creek Cutoff, Plateau Creek, and Snake River Park. All traps, all baits, scent lures, equipment, and closure signs were removed from these sites on August 6, 2011. No grizzly bears were captured during this effort. Two black bears were captured south of Fox Park. Only 1 set of fresh grizzly bear tracks were observed during the trapping efforts. The Department personnel encountered several hikers and USFS volunteers who commented on the lack of grizzly bear sign in the areas they had been traveling in. It appears grizzly bear densities were

low in the area during this effort, possibly due to the very late spring snowmelt and delayed green-up.

Wind River Reservation

In late August, the Large Carnivore Section assisted Wind River Tribal Fish and Game personnel and the U.S. Fish & Wildlife Service (USFWS) in conducting trapping operations to monitor population demographics and distribution of grizzly bears in the Crow Creek and East Fork drainages of the northern Wind River Reservation (WRR). These areas lie along the southeastern edge of current grizzly bear distribution and will likely be the conduit for dispersal onto other tribal, state, federal, and private lands to the east and south. This area of the WRR was previously trapped in 2006, when 6 grizzlies (3 males and 3 females) were captured. Radio collars were placed on all 6 grizzly bears at the time of capture. However, since 2006, all 6 of those grizzly bears have either lost their collars or died.

Six trap sites were set from August 11 to August 24, 2011. Four grizzly bears were captured during this time and radio collars were placed on 2 of them. All grizzly bears were released at the capture site and which included:

- GB 685, 8/15/11, Crow Creek, adult male, tags and samples, GPS transmitter.
- GB 586, 8/15/11, Crow Creek, adult male, tags and samples, VHF transmitter.
  - Recapture of a bear caught in Grass Creek in 2008.
- G172, 8/18/11, Crow Creek, adult male, tags and samples, uncollared.
- G173, 8/24/11, Crow Creek, subadult male, tags and samples, uncollared.

An adult female black bear was also captured in Crow Creek. She was ear-tagged and had samples taken.

Population monitoring for 2011 ended in late-August when WRR hunting seasons began. Overall, this effort provided all cooperators an opportunity to work together and develop a better understanding of grizzly bear ecology and recovery of this species.

2011 WGFD Grizzly Bear Observation Flights

In 2011, Grizzly Bear Observation Units (GBOUs) in the southern portion of the GYE (Figure 1) were flown once due to efforts to reduce flight time and low sight-ability of grizzly bears in these areas. These surveys were conducted during June to maximize potential for observations. Northern GBOUs were flown twice, once in July and August. Total observations during Round 1 increased from 68 grizzly bears in 2010 to 141 bears in 2011 (Table 1). Record snowfalls during the winter of 2010-11 and persistent, residual snow cover well into summer created difficult conditions for moths to colonize traditional sites in talus slopes by July. This was particularly noticeable in central Bear Management Units. However, GBOUs containing moth sites on the eastern edge of the Absaroka Mountains (16A and 24) contained many more bears then are traditionally present, likely due to earlier snowmelt on these sites. The number of females with cubs-of-year (F_{coy}) groups observed in Round 1 was also higher than in 2010, with 10 observed in 2011 versus 5 in 2010.

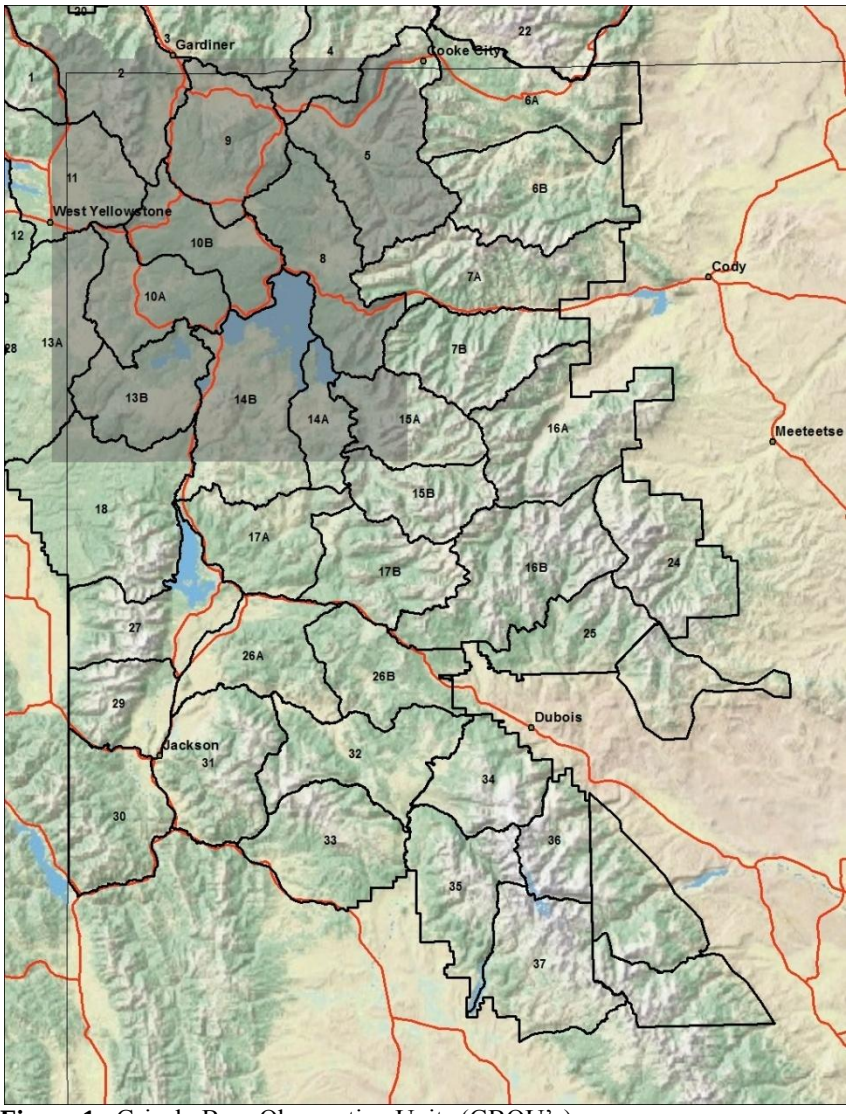

Figure 1. Grizzly Bear Observation Units (GBOU's).

For the second round of flights in August, only northern GBOUs were flown. Comparing units between Round 1 and 2 survey efforts, the number of grizzly bears observed was very similar (Table 2). However, observations were more evenly distributed throughout all units containing moth sites, not just units on the eastern front of the Absaroka Mountains. A total of 134 grizzly bears were observed during Round 2 in 2011, compared to 182 in 2010 across the survey area. The number of F_{coy} groups was also lower than in 2010, and the lowest count in the last 4 years. Only 10 F_{coy} groups were observed during Round 2 in 2011 versus 15 in 2010, 30 in 2008, and 19 in 2009.

It should be noted that these data, alone, should not be used to determine population status or trends in number of F_{coy} groups. Not all of F_{coy} groups observed will count toward the population estimate until they have been analyzed to determine whether they are unique (i.e., non-duplicate) sightings.

Table 1. Composition of grizzly bears observed in Round 1 during 2011 observation surveys in Wyoming.

		Females with COY (# of cubs)			Females with Ylgs. (# of yearlings)			Females with 2 YO (# of young)			All Other Grizzly
		1	2	3	1	2	3	1	2	3	Bears
Date	**Unit**										
----	6A	Not Flown									
8/13	6B	1	0	0	0	0	0	0	0	0	9
8/13	7A	0	0	0	0	0	0	0	1	0	8
7/21	7B	0	0	0	0	0	0	0	0	0	2
7/22	15A	0	0	0	0	0	0	0	0	0	3
7/23	15B	0	1	0	0	0	0	1	0	0	7
7/24	16A	0	4	0	0	1	0	0	0	0	22
7/25	16B	0	0	1	0	1	0	0	0	0	7
7/28	17A	0	0	0	0	0	0	0	0	0	1
7/27	17B	0	0	0	0	0	0	0	0	0	1
7/28	24	0	1	1	1	1	1	0	0	0	26
7/26	25	0	0	1	0	0	0	0	0	0	0
6/17	26A	0	0	0	0	0	0	0	0	0	0
6/15	26B	0	0	0	0	0	0	0	0	0	0
7/28	29	0	0	0	0	0	0	0	0	0	0
6/21	30	0	0	0	0	0	0	0	0	0	0
6/17	31	0	0	0	0	0	0	0	0	0	0
6/20	32	0	0	0	0	0	0	0	0	0	1
6/25	33	0	0	0	0	0	0	0	0	0	0
6/22	34	0	0	0	0	0	0	0	0	0	0
6/24	35	0	0	0	0	0	0	0	0	0	2
6/22	36	0	0	0	0	0	0	0	0	0	0
6/25	37	0	0	0	0	0	0	0	0	0	0
Totals		**1**	**6**	**3**	**1**	**3**	**1**	**1**	**1**	**0**	**89**

Total # of Bears Observed – 141

Table 2. Composition of grizzly bears observed in Round 2 during 2011 observation surveys in Wyoming.

		Females with COY (# of cubs)			Females with Ylgs. (# of yearlings)			Females with 2-Y-O (# of young)			All Other Grizzly
		1	2	3	1	2	3	1	2	3	Bears
Date	**Unit**										
8/17	6A	0	0	0	0	0	0	0	0	0	0
8/29	6B	0	0	0	0	0	0	0	0	0	1
8/29	7A	0	0	0	0	0	0	0	0	0	0
8/21	7B	1	0	0	0	0	0	0	0	0	13
8/22	15A	0	0	0	0	0	0	0	1	0	6
8/23	15B	0	0	0	0	1	0	0	0	0	9
8/24	16A	0	4	0	0	0	0	0	0	0	19
8/25	16B	0	0	1	0	0	0	0	0	0	7
8/28	17A	0	1	0	0	0	0	0	0	0	2
8/27	17B	0	0	3	0	1	0	0	0	0	9
8/20	24	0	0	0	0	0	1	1	1	0	17
8/26	25	0	0	0	0	0	0	0	0	0	0
Totals		**1**	**5**	**4**	**0**	**2**	**1**	**1**	**2**	**0**	**83**

Total # of Bears Observed – 134

Hunter Numbers

Compiled by: Justin G. Clapp, Wyoming Game and Fish Department; Kevin Frey, Montana Department of Fish, Wildlife and Parks; and Daryl Meints, Idaho Department of Fish and Game.

State wildlife agencies in Idaho, Montana, and Wyoming annually estimate the number of hunters for each big game species. We used state estimates for the number of elk hunters by hunt area as an index of trend in hunter numbers for the Grizzly Bear Recovery Zone plus the 10-mile perimeter area. Because some hunt area boundaries do not conform exactly to the Recovery Zone and 10-mile perimeter area, regional biologists familiar with each hunt area were queried to estimate hunter numbers within the Recovery Zone plus the 10-mile perimeter area. Elk hunters were used because they represent the largest cohort of hunters for an individual species. While there are sheep, moose, and deer hunters using the Recovery Zone and 10-mile perimeter area, their numbers are relatively small in relation to elk hunter numbers and many hunt these species in conjunction with elk. Elk hunter numbers represent a reasonably accurate index of trend of total hunter numbers within areas occupied by grizzly bears in the GYE.

We generated data from all states from 2001 to 2011 (Table 3). Complete data does not exist for all years. While Montana does calculate these numbers, the data are usually not available until the following year. As these data become available they will be added to the revised table in the future.

There has been a significant downward trend in hunter numbers in Idaho, Montana, and Wyoming since 2002, when hunter numbers peaked at 34,879 (Figure 2). Hunter numbers in Idaho appear to have stabilized around 1,900 since they peaked at 3,619 in 2005. Hunter numbers in Montana peaked at 17,908 in 2002 and since that time have decreased to

approximately 12,500. Wyoming has experienced the largest decrease in hunter numbers over the last ten years. Hunter numbers have decreased from 13,709 in 2002 to fewer than 6,500 in 2011. Both Montana and Wyoming began to decrease the harvest of female elk in the mid 2000s as some elk herds approached their population objectives. Idaho reduced harvest objectives for females in 2008, which accounts for the decrease in hunter numbers in 2008 through 2011.

Table 3. Estimated numbers of elk hunters within the Primary Conservation Area plus a 10-mile perimeter in Idaho, Montana, and Wyoming, for the years 2001-2011.

	Year										
State	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Idaho	2,914	3,262	3,285	3,454	3,619	3,016	2,592	1,763	1,819	1,904	1,860
Montana	15,407	17,908	16,489	14,320	12,365	12,211	12,635	12,470	12,382	12,334	12,269
Wyoming	13,591	13,709	11,771	10,828	9,888	9,346	8,716	8,792	8,440	6,712	6,413
Total	31,912	34,879	31,545	28,602	25,872	24,573	23,943	23,025	22,641	20,950	20,542

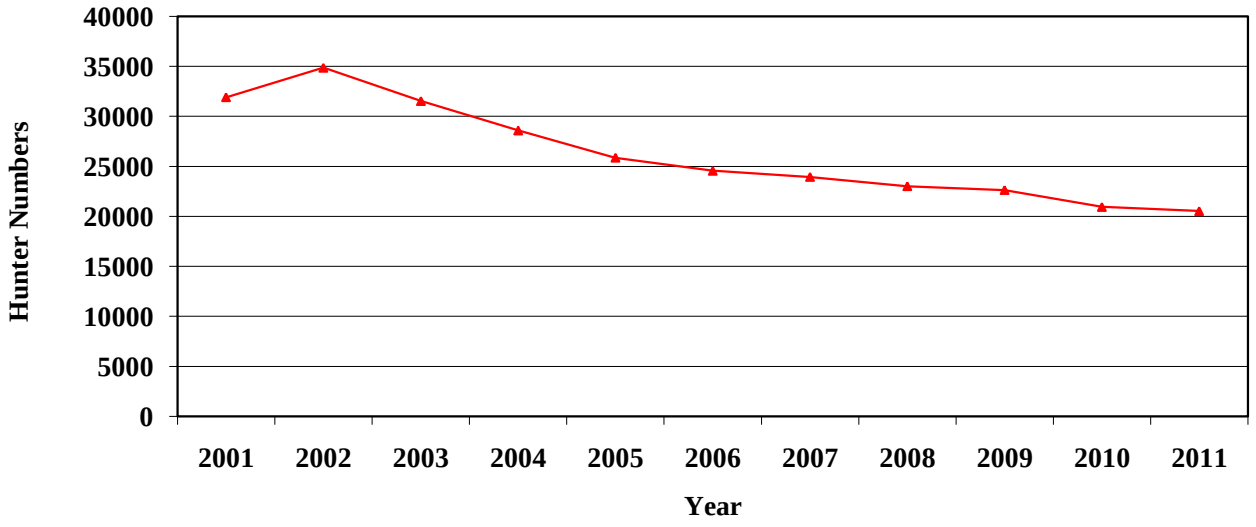

Figure 2. Trend in elk hunter numbers within the Primary Conservation Area plus a 10-mile perimeter in Idaho, Montana, and Wyoming, 2001-2011.

Moth Site Use by Grizzly Bears

Compiled by: Dan Bjornlie, Wyoming Game and Fish Department; and Mark Haroldson, Interagency Grizzly Bear Study Team.

Army cutworm moths (*Euxoa auxiliaris*) were first recognized as an important food source for grizzly bears in the GYE during the mid 1980s (Mattson et al. 1991b, French et al. 1994). Early observations indicated that moths, and subsequently grizzly bears, showed specific site fidelity. These sites are generally high alpine areas dominated by talus and scree adjacent to areas with abundant alpine flowers. Such areas are referred to as "insect aggregation sites." Since their discovery, numerous grizzly bears have been counted on or near these aggregation sites due to excellent sightability from a lack of trees and simultaneous use by multiple grizzly bears.

Complete tabulation of grizzly bear presence at insect sites is extremely difficult. Only a few sites have been investigated by ground reconnaissance and the boundaries of sites are not clearly known. In addition, it is likely that the size and location of insect aggregation sites fluctuate from year to year with moth abundance and variation in environmental factors such as snow cover.

Since 1986, when insect aggregation sites were initially included in aerial observation surveys, our knowledge of these sites has increased annually. Our techniques for monitoring grizzly bear use of these sites have changed in response to this increase in knowledge. Prior to 1997, we delineated insect aggregation sites with convex polygons drawn around locations of grizzly bears seen feeding on moths and buffered these polygons by 500 m. The problem with this technique was that small sites were overlooked due to the inability to create polygons around sites with fewer than 3 locations. From 1997-99, the method for defining insect aggregation sites was to inscribe a 1 km circle around the center of clusters of observations in which grizzly bears were seen feeding on insects in talus/scree habitats (Ternent and Haroldson 2000). This method allowed for trends in grizzly bear use of sites to be annually monitored by recording the number of grizzly bears documented in each circle (i.e., site).

We developed a new technique in 2000. Using this technique, sites were delineated by buffering only the locations of grizzly bears observed actively feeding at insect aggregation sites by 500 m to account for error in aerial telemetry locations. The borders of the overlapping buffers at individual insect sites were dissolved to produce a single polygon for each site. These sites are identified as "confirmed" sites. Because these polygons are only created around feeding locations, the resulting site conforms to the topography of the mountain or ridge top where grizzly bears feed and does not include large areas of non-talus habitat that are not suitable for cutworm moths. Locations from the grizzly bear location database from July 1 through September 30 of each year were then overlaid on these polygons and enumerated. The technique to delineate confirmed sites developed in 2000 substantially decreased the number of sites described compared to past years in which locations from both feeding and non-feeding grizzly bears were used. Therefore, annual analysis for this report is completed for all years using this technique. Areas suspected as insect aggregation sites but dropped from the confirmed sites list using this technique, as well as sites with only one observation of an actively feeding grizzly bear or multiple observations in a single year, are termed "possible" sites and will be monitored in subsequent years for additional observations of actively feeding grizzly bears. These sites may then be added to the confirmed sites list. When possible sites are changed to confirmed

sites, analysis is done on all data back to 1986 to determine the historic use of that site. Therefore, the number of grizzly bears using insect aggregation sites in past years may change as new sites are added, and data from this annual report may not match that of past reports. In addition, as new actively feeding grizzly bear observations are added to existing sites, the polygons defining these sites increase in size and, thus, more overlaid locations fall within the site. This retrospective analysis brings us closer each year to the "true" number of grizzly bears using insect aggregation sites in past years.

In 2011, actively feeding grizzly bears were observed on 1 site classified as possible in past years. Therefore, this site was reclassified to confirmed and merged with an adjacent site due to its proximity. Analysis was done back to 1986 for this newly combined site. There were 4 observations of grizzly bears actively feeding in previously unknown areas in 2011. These sites were classified as possible. In addition, one long-term possible site was removed from the list of moth sites due to lack of grizzly bears observed on that site. Adding the new possible sites, and the reclassified site to the 2010 sites, and removing the old possible site produced 37 confirmed sites and 16 possible sites for 2011.

The percentage of confirmed sites with documented use by grizzly bears varies from year to year, suggesting that some years have higher moth activity than others (Figure 3). For example, 1993-95 were probably poor moth years because the percentage of confirmed sites used by bears (Figure 3) and the number of observations recorded at insect sites (Table 4) were low. Overall, insect aggregation site use by grizzly bears increased by 9% in 2011 (Figure 3). The number of observations or telemetry relocations at sites increased from 2010, as well (Table 4). The number of insect aggregation sites used by bears in 2011 increased by 3 sites to 25 (Table 4) and was higher than the 5-year average of 22.6 sites/year from 2006-10.

Photo 1. Grizzly bear digging army cutworm moths at an alpine insect aggregation site.

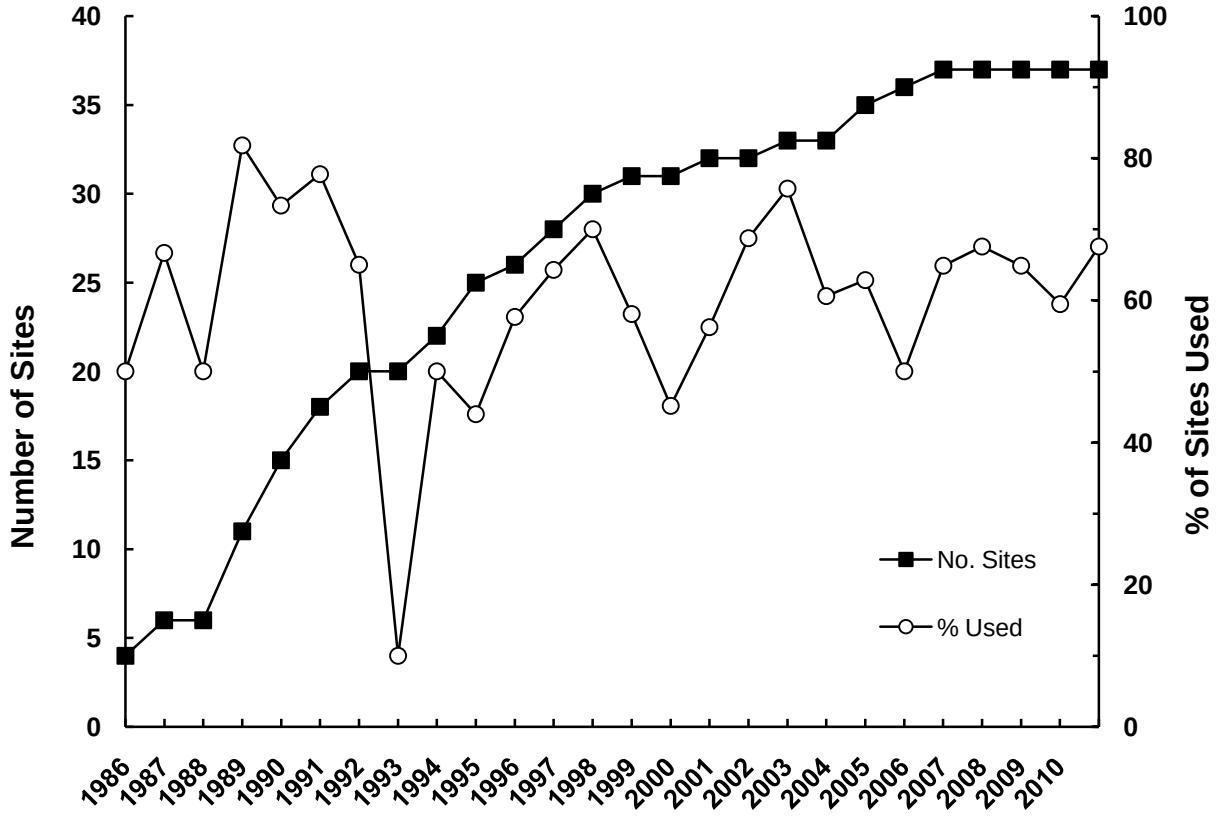

Figure 3. Annual number of confirmed insect aggregation sites and percent of those sites at which either telemetry relocations of marked grizzly bears or visual observations of unmarked bears were recorded, Greater Yellowstone Ecosystem, 1986-2011.

Table 4. The number of confirmed insect aggregation sites in the Greater Yellowstone Ecosystem annually, the number used by grizzly bears, and the total number of aerial telemetry relocations and ground or aerial observations of grizzly bears recorded at sites during 1986-2011.

Year	Number of confirmed moth sites[a]	Number of sites used[b]	Number of aerial telemetry relocations	Number of ground or aerial observations
1986	4	2	5	5
1987	6	4	7	8
1988	6	3	12	29
1989	11	9	11	42
1990	15	11	8	76
1991	18	14	12	166
1992	20	13	5	99
1993	20	2	1	1
1994	22	11	1	28
1995	25	11	7	37
1996	26	15	21	66
1997	28	18	18	79
1998	30	21	11	173
1999	31	18	25	156
2000	31	14	39	89
2001	32	18	24	119
2002	32	22	36	239
2003	33	25	10	161
2004	33	20	2	131
2005	35	22	15	181
2006	36	18	19	180
2007	37	24	15	173
2008	37	25	21	215
2009	37	24	8	180
2010	37	22	4	158
2011	37	25	9	196
Total			346	2987

[a] The year of discovery was considered the first year a telemetry location or aerial observation was documented at a site. Sites were considered confirmed after additional locations or observations in a subsequent year and every year thereafter regardless of whether or not additional locations were documented.

[b] A site was considered used if ≥1 location or observation was documented within the site that year.

The IGBST maintains an annual list of unduplicated F_{coy}. Since 1986, 858 initial sightings of unduplicated F_{coy} have been recorded, of which 229 (27%) have occurred at (within 500m, n = 213) or near (within 1,500m, n = 16) insect aggregation sites (Table 5). In 2011, 7 of 39 (17.9%) initial sightings of unduplicated F_{coy} were observed at insect aggregation sites, similar to 17.6% from 2010 (Table 5), but lower than the 5-year average of 24.1% from 2006-10.

Survey flights at insect aggregation sites contribute to the count of unduplicated F_{coy}; however, it is typically low, ranging from 0-20 initial sightings/year since 1986 (Table 5). If these sightings are excluded, a similar trend in the annual number of unduplicated sightings of F_{coy} is still evident (Figure 4), suggesting that some other factor besides observation effort at insect aggregation sites is responsible for the increase in sightings of females with cubs.

Photo 2. Grizzly bear on snow field on insect aggregation site.

Table 5. Number of initial sightings of unduplicated females with cubs-of-the-year (Fcoy) that occurred on or near insect aggregation sites, number of sites where such sightings were documented, and the mean number of sightings per site in the Greater Yellowstone Ecosystem, 1986-2011.

	Unduplicated Fcoy [a]	Number of moth sites with an initial sighting[b]	Initial sightings			
			Within 500 m[b]		Within 1,500 m[c]	
				%		%
1986	25	0	0	0.0	0	0.0
1987	13	0	0	0.0	0	0.0
1988	19	1	2	10.5	2	10.5
1989	16	1	1	6.3	1	6.3
1990	25	3	3	12.0	4	16.0
1991	24	8	12	50.0	14	58.3
1992	25	5	7	28.0	9	36.0
1993	20	1	1	5.0	1	5.0
1994	20	3	5	25.0	5	25.0
1995	17	2	2	11.8	2	11.8
1996	33	7	7	21.2	7	21.2
1997	31	8	11	35.5	11	35.5
1998	35	10	13	37.1	13	37.1
1999	33	3	6	18.2	7	21.2
2000	37	6	8	21.6	10	27.0
2001	42	6	12	28.6	13	31.0
2002	52	11	17	32.7	17	32.7
2003	38	11	19	50.0	20	52.6
2004	49	11	16	32.7	16	32.7
2005	31	5	7	22.6	9	29.0
2006	47	11	14	29.8	15	31.9
2007	50	10	17	34.0	17	34.0
2008	44	7	11	25.0	14	31.8
2009	42	4	6	14.3	6	14.3
2010	51	7	9	17.6	9	17.6
2011	39	7	7	17.9	7	17.9
Total	858		213		229	
Mean	33.0	5.7	8.2	22.6	8.8	24.5

[a] Initial sightings of unduplicated Fcoy; see Table 4.
[b] Insect aggregation site is defined as a 500-m buffer drawn around a cluster of observations of bears actively feeding.
[c] This distance is 3 times what is defined as an insect aggregation site for this analysis, since some observations could be made of bears traveling to and from insect aggregation sites.

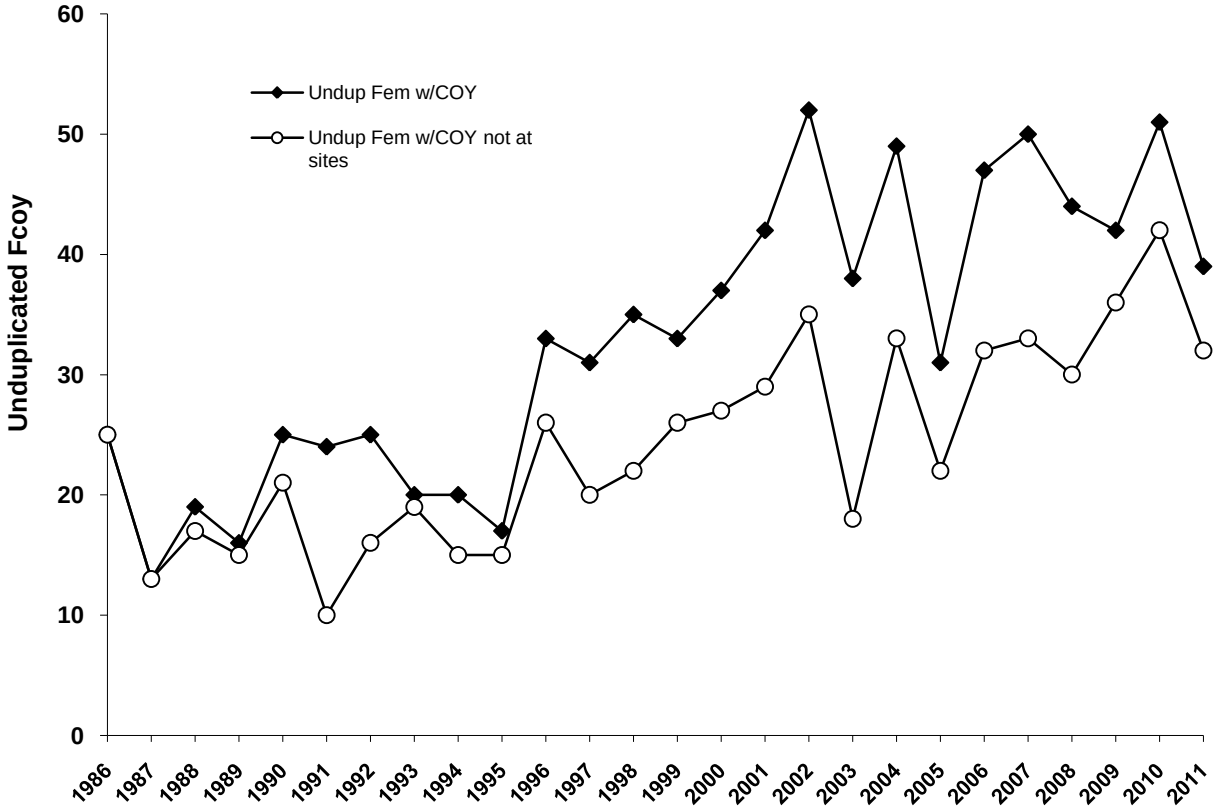

Figure 4. The total number of unduplicated Fcoy observed annually in the Greater Yellowstone Ecosystem and the number of unduplicated Fcoy *not* found within 1500m of known insect aggregation sites, 1986-2011.

Distribution Analyses

The distribution of the GYE grizzly bear population continues to expand into areas and habitats unoccupied since the early twentieth century. Up to date information on the extent of this distribution is crucial to make informed decisions regarding grizzly bear management. Schwartz et al. (2006) used kernel density estimators of radio-marked individual bears as well as composite kernels of locations of conflicts, mortalities, female bears with cubs of the year. This method was logistically cumbersome and excluded observations of unmarked bears and incidences of conflict and/or mortalities that occurred outside of suitable habitat. The primary objective for this analysis was to develop a technique to document grizzly bear distribution that would allow for all valid data to be used in estimation of distribution, as well as provide the simplicity to be updated on an annual basis as the grizzly bear population in the GYE continues to expand.

After evaluating many different methods, 3 techniques were chosen for comparison: 1) a simple buffer of confirmed grizzly bear locations with the buffer distance determined by the variance of the x, y location data, 2) occupancy modeling using the program PRESENCE to provide probability of occupancy for a give area based on the number of locations and the values of

covariates in the model, and 3) kriging - a spatial statistics technique that interpolates a surface based on point values given for a specific area. For all 3 of these methods, a GIS was used to overlay a 3km x 3km grid over the GYE and all grizzly bear locations from 1990-2004 and 1990-2010 were placed over the grid. A cell is considered occupied if any grizzly bear location occurs within the cell and is then given a center point location for use in the analysis. This reduces the influence of the abundance of GPS location data in the interior of the ecosystem. Future work will include a manuscript that will provide results on the suitability of each of these techniques and comparisons to the previously estimated 1990-2004 kernel distribution from Schwartz et al. (2006).

FUNDING

Conservation Strategy Funding

The request for Conservation Strategy (CS) funding was submitted to USFWS on April 6. This request was for additional money to assure that adequate data collection, Bear Wise Community Programs, and information and education programs could be implemented as specified in the CS. The Department continues to fulfill all of its obligations for data collection as part of the CS. These funds are necessary to insure that we can continue to collect data as grizzly bears increase numerically and expand occupied habitat.

Amount Requested	Justification	Reporting
$14,000	Supplies for Bear Wise Community Projects through the Department conflict program. This project is ongoing and is designed to be used as a template for establishing similar community efforts in other cities within occupied bear habitat.	An annual summary will be reported in the CS and IGBST annual Reports.
$10,000	Flight time to conduct observation surveys in newly created observation units 26A-37.	All annual monitoring will be reported in the CS and IGBST annual Reports.
$20,000	1 contract employee to assist with camera deployment (6 months) and/or research trapping. This employees will be used to either augment research-trapping efforts and/or use remote cameras to document grizzly bear distribution outside the Primary Conservation Area in areas where documentation of distribution is lacking.	All annual monitoring will be reported in the CS and IGBST annual Reports.
$7,000	Educational supplies to implement Information and Education efforts identified in CS. Primarily to assist with brochure development with the Center for Wildlife Information.	All annual monitoring will be reported in the CS and IGBST annual Reports.
$51,000		

Section 6 Funding Request

	**Endangered Species** **SECTION 6 FUNDING** **PROGRAM NARRATIVE STATEMENT** **WYOMING** **E-1-89**
Title:	Grizzly Bear
Total Cost:	$428,947- This includes temporary personnel, salaries, supplies, travel, and surveys.
Time Period:	July 1, 2011 – June 30, 2012
Project Leader:	David S. Moody, Trophy Game Research/Management Coordinator 260 Buena Vista, Lander, WY 82520 Mark Bruscino, Bear Conflict Program Coordinator 2820 State Hwy 120, Cody, WY 82414 Dennie Hammer, Information & Education Coordinator 2820 State Hwy 120, Cody, WY 82414
Location:	The program area encompasses all areas within the state of Wyoming in the Yellowstone Ecosystem outside of Yellowstone and Grand Teton National Parks. Additional activities may be completed within Yellowstone and Grand Teton National Parks in conjunction with the National Park Service (NPS). Coordination also occurs between the Department and appropriate National Forests in conjunction with the USFS, Bureau of Land Management (BLM), USFWS Service, and state lands as required.
Need:	The Department's grizzly bear program involves research/management projects designed to determine various population characteristics and habitat use of grizzly bears in the southern third of the Yellowstone Ecosystem and to manage grizzly bear/livestock and human interactions. Management programs are directed towards monitoring the grizzly bear population trend through observation flights that define the distribution of grizzly bears within bear management units (BMUs), document females with cubs of the year and detailed monitoring of radio-collared individuals to assess important movement, seasonal habitat use, food selection, and survival estimates. Due to the long-lived, wide-ranging characteristics of grizzly bears, adequate information is needed for sound management decisions. Additional data will be needed to show trends in grizzly bear activities associated with road construction, timber management, mineral development, and cattle grazing in

	the southern BMU, especially in areas outside the recovery area, which are presently occupied by grizzly bears. The state currently funds one seasonal trap personnel; however, additional funds are requested for 1 additional person to assist in trapping grizzly bears and conducting remote camera surveys to document distribution and expansion of the population into the Wyoming Range and the southern portions of the Wind River Range. The state will fund the necessary training, supplies, travel, vehicles, and other associated equipment for these positions. Priority conflict efforts include responding to all nuisance bear complaints. All known mortalities are investigated in cooperation with the U.S. Fish and Wildlife Service. Bears involved in nuisance conflicts will be trapped as required. Grizzly bear/human conflict management will continue to be a high priority during recovery and management of the Yellowstone area grizzly bear population. Conflict management is essential to reducing human caused bear mortalities and maintaining public support of recovery efforts. Section 6 funds are needed to assist with local working groups to increase public awareness of bear safety issues. Section 6 funding has previously been used to offset some of the costs for radio collars and aerial surveys, including telemetry flights to determine grizzly bear locations. Without section 6 funding, manpower, population and habitat data collection, and response rates to manage nuisance grizzly bears would be decreased. Previous allocations of Section 6 funds have not adequately covered the costs of the above items, which may hinder data collection to assure that monitoring is completed as described in the Conservation Strategy (CS). Additional funds are required to assure that aerial relocation schedules can be maintained.
Objectives:	1) Assist IGBST in determining food habits, habitat use, distribution, population trend, allowable mortality thresholds, and other important parameters for grizzly bears within the southern BMUs. 2) Provide comparative data to that already gathered by the IGBST, to the State of Idaho and the State of Montana. 3) And manage grizzly bear/human interaction, grizzly bear/livestock interaction, and mortality data specific for each BMU to aid state and federal managers in minimizing human caused mortalities. 4) Continue to provide important information and educational efforts to assist with grizzly bear awareness issues, distribute information to hunters and the general public on bear safety, and continue to conduct numerous workshops on how to live safely in areas occupied by grizzly bears.
Approach:	1) <u>Trapping and Handling</u> Grizzly bears will be captured using Aldrich foot snares and trailer mounted culvert traps. Each grizzly bear will be ear tagged, lip tattooed for later

	identification, and fitted with a radio-collar. All collars are modified to fall off within 2 years using cotton spacers. Research-trapping efforts for grizzly bears are to be conducted on the Shoshone (SNF) and Bridger Teton (BTNF) National Forests, as well as BLM and private lands, as required. Trapping schedules are developed jointly with the IGBST to assure adequate coverage outside the National Parks so that home range analysis corresponds to known grizzly bear distribution. 2) Telemetry and Home Range Analysis Grizzly bear locations will be determined using fixed wing aircraft, along with intensive sampling from the ground. The home ranges of collared animals will be calculated using the Harmonic Mean method. 3) Grizzly Bear/Livestock Interactions Grizzly Bear/livestock interactions will be managed as per the "Interagency Grizzly Bear Guidelines" and appropriate state and federal laws and regulations. 4) Annual Data Collection Locations of radio-collared grizzly bears will be monitored with aerial flights. Cattle carcasses in the study area will also be investigated to determine cause of death. Detailed biological and physiological data will be gathered on each bear captured. 5) Grizzly Bear/Human Interactions The Department will continue to evaluate all grizzly bear/human interactions and take appropriate management actions in accordance with "Interagency Grizzly Bear Guidelines". 6) Multi-Agency Effort The CS has set some objectives related to data collection to assure that population status and other indices can be assessed annually for this population. This requires that several agencies work cooperatively to meet these goals. As a result, the states of Idaho, Montana, and Wyoming along with several federal agencies, share in the data collection and analysis of that data. All of the affected agencies, both state and federal, have signed the CS to assure that this collaboration continues into the future.
Expected Results:	The goal of this program is to capture and radio-collar grizzly bears to provide an even distribution of radio-collared grizzly bears and to enhance the annual life history data of grizzly bears occupying new regions of the Yellowstone Ecosystem outside the Recovery Area. Without this data, survival rates by age and sex will be compromised as data will only be available from a portion of the ecosystem.

	Observation flights are a key component of the annual data collection scheme. Section 6 funding would assure that adequate coverage of all occupied habitat is surveyed. New techniques may be investigated as warranted to test timing and frequency of these flights. Results would assist in providing a more accurate estimate of F_{coy} that is used to establish the population estimate. These funds will assure that data collection is consistent across the entire ecosystem, which is required to accurately assess population status. These funds will also assure that conflicts between grizzly bears and humans will be managed in a timely and consistent process. The number of conflicts continues to increase in Wyoming's portion of the ecosystem. With additional funding, the Department's information and education efforts can be increased to assure that larger segments of the public are contacted to increase their awareness of how to recreate and live in occupied grizzly bear habitat.

Financial Request:

	TOTAL	FEDERAL	STATE
Contracts: Aerial Telemetry & Observation Flights	$91,345	$68,509	$22,836
Field Supplies: Radio Collars, Supplies, Travel, Repairs			
Management/Research Branch	$50,365	$37,774	$12,591
Conflict Management Branch	$129,841	$97,381	$32,460
Personnel: (AWEC/Temp personnel)			
Management/Research Branch	$16,485	$12,364	$4,121
Conflict Management Branch	$120,911	$90,683	$30,228
Information/Education: Supplies	$20,000	$15,000	$5,000
TOTAL:	$428,947	$321,710	$107,237

For fiscal year 2012 (July 1, 2011 – June 30, 2012) the Department was awarded $75,000 in Section 6 funds of the $428,947 requested.

CONFLICT MANAGEMENT

Grizzly Bear Relocations and Removals

Introduction

Human-grizzly bear interactions and conflicts in Wyoming are typically a result of grizzly bears seeking unnatural foods in association with people, property, or when they kill livestock. The number and location of human-grizzly bear conflicts is influenced by unsecured unnatural attractants (i.e., human foods and garbage), natural food distribution and abundance, grizzly bear numbers and distribution, and human and livestock use patterns on the landscape.

Capturing grizzly bears in areas where they may come into conflict with people and relocating them to remote wildland settings is a common practice throughout the world where humans and bears share the land. Relocating grizzly bears achieves several social and conservation functions: 1) it reduces the chance of property damage, livestock damage, or human interactions in areas where the potential for conflict is high; 2) it reduces the potential for grizzly bears to become food conditioned and/or human habituated which often times results in destructive and/or dangerous behaviors; 3) it allows bears the opportunity to forage on natural foods and remain wary of people; 4) relocation can prevent removing grizzly bears from the population and may be beneficial in meeting population management objectives.

The Department relocates and removes black and grizzly bears as part of routine management operations. The decision to relocate or remove a bear is made after considering a number of variables including age and sex of the animal, behavioral traits, health status, physical injuries or abnormalities, type of conflict, severity of conflict, known history of the animal, human safety concerns, and population management objectives. Grizzly bears are relocated in accordance with state and federal law, regulation, and policy.

In 2005, the Wyoming Legislature enacted House Bill 203, which created Wyoming Statute §23-1-1001. Subsequently, the Wyoming Game and Fish Commission promulgated Chapter 58, Notification of Grizzly Bear Relocation Regulation, to further direct implementation of Wyoming Statute §23-1-1001. Complete texts of the statute and the regulation will follow this narrative for the reader's information.

Grizzly Bear Management Captures, Relocations, and Removals

During 2011, the Department captured 39 grizzly bears in an attempt to prevent or resolve conflicts (Figure 5). Twenty-nine captures involved lone grizzly bears, 1 was an adult female with 2 cubs-of-the-year, 1 was an adult female with 3 cubs-of-the-year, and 1 was an adult female with 2 yearlings. Twenty-four (62%) of the 39 capture events occurred in Park County, 6 (15%) in Sublette County, 5 (13%) in Fremont County, 2 (5%) in Teton County, and 2 (5%) in Hot Springs County (Table 6).

Of the 39 capture events, 23 (59%) involved grizzly bears that were relocated from areas where they were causing conflicts with livestock or property, or moved preemptively to avoid conflicts.

One grizzly bear cub was caught in a bobcat trap and released on site, and 1 yearling female was released on site because the mother could not be captured. Fourteen capture events involved grizzly bears that were removed from the population by agency personnel due to a history of previous conflicts, a known history of close association with humans, or they were deemed unsuitable for release into the wild (i.e., orphaned cubs, poor physical condition, or human safety concern). All relocated grizzly bears were released on USFS (n=20) or Department (n=3) lands in or adjacent to the Grizzly Bear Recovery Zone (RZ) (Figure 6). Of the 23 relocation events, 13 (57%) bears were released in Teton County, 7 (30%) were released in Park County, and 3 (13%) were released in Fremont County (Table 6).

All independent grizzly bears >2 years old, which were relocated, were fitted with a VHF radio-tracking collar (n=17) to track their movements after release. Aerial attempts to obtain location data were made approximately every 10-14 days. Relocated grizzly bears wearing radio collars moved a mean straight-line distance of 49.1 miles (range = 5.0 - 121.3 mi; SD = 44.8) from the release site to their last known location in 2011. Of the 13 grizzly bears for which good movement data exist, 5 moved back to within 10 miles of their original capture site, but were not known to cause additional conflicts. All 13 grizzly bears were on USFS or National Park Service lands and 8 of the 13 remained in the RZ as of their last known location in 2011.

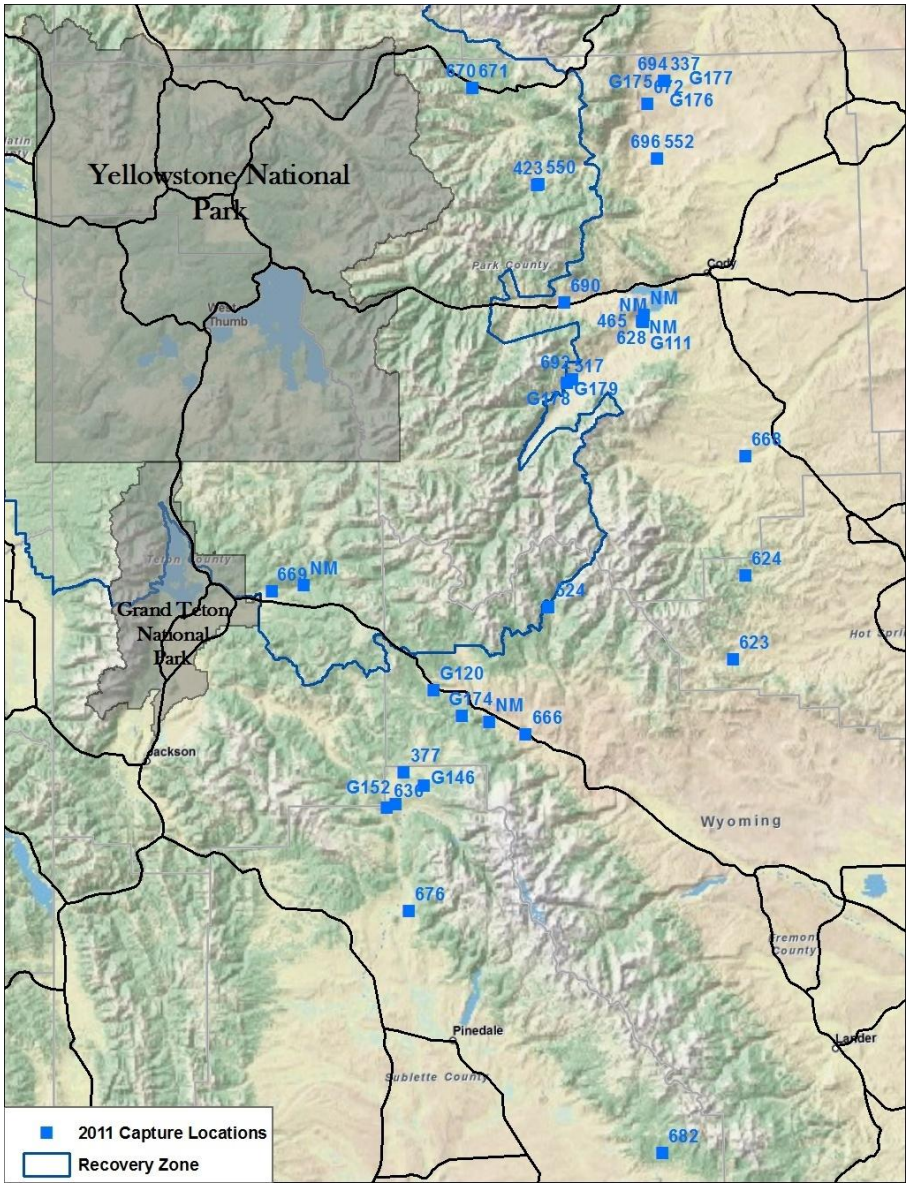

Figure 5. Capture locations (n=39) for grizzly bears captured, relocated, released, or removed in 2011. Grizzly bears with "G" in front of their number were marked but not wearing radio collars upon release typically because they were too young to be collared. Grizzly bears identified with "NM" were non-target grizzly bears released without handling.

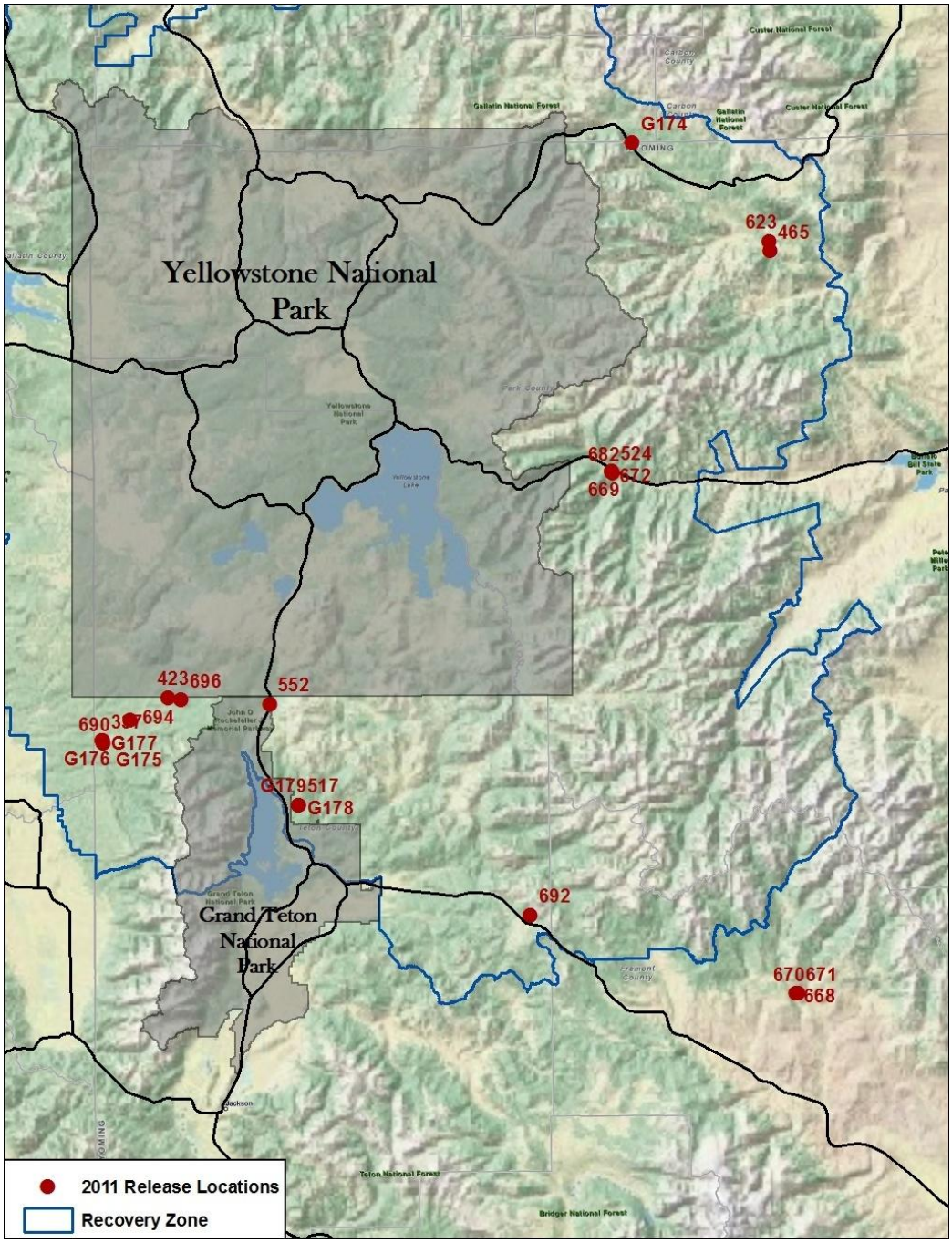

Figure 6. Release locations (n=23) for grizzly bears captured, relocated, or released on site in 2011. Grizzly bears with "G" in front of their number were marked but not wearing radio collars upon release typically because they were too young to be collared. Grizzly bears identified with "NM" were non-target grizzly bears released without handling.

Table 6. Date, Grizzly Bear ID number, Capture County, Relocation Site, Release County, Reason for Capture, and Remarks for all 2011 grizzly bear management captures (N = 39) in Wyoming.

DATE	ID	Capture County	Relocation Site	Release County	Reason for Capture	Remarks
5/3/2011	668	Park	Wiggins Fork	Fremont	Preemptive	Near calving pasture
5/7/2011	624	Hot Springs	Removed	NA	Property Damage	Broke into cabin and trailer
5/7/2011	669	Teton	N.FK. Shoshone River	Park	Property Damage	Into fish and livestock feed
5/11/2011	670	Park	Wiggins Fork	Fremont	Property Damage	Broke into grain shed
5/12/2011	671	Park	Wiggins Fork	Fremont	Property Damage	Broke into grain shed
5/14/2011	672	Park	N.FK. Shoshone River	Park	Food Reward	Into trash and bird feeders at residence
7/3/2011	676	Sublette	On Site	NA	Livestock Damage	Cattle damage
7/16/2011	G146	Sublette	Removed	NA	Livestock Damage	Sheep damage
7/26/2011	623	Hot Springs	Clarks Fork	Park	Livestock Damage	Cattle damage
7/27/2011	G152	Sublette	Removed	NA	Livestock Damage	Cattle damage
7/29/2011	682	Sublette	N.FK. Shoshone River	Park	Livestock Damage	Sheep damage
8/7/2011	G111	Park	Cleveland Zoo	NA	Food Reward	Into trash and grain at residence
8/8/2011	NA	Park	Cleveland Zoo	NA	Food Reward	Into trash and grain at residence
8/8/2011	NA	Park	Cleveland Zoo	NA	Food Reward	Into trash and grain at residence
8/24/2011	377	Sublette	Removed	NA	Livestock Damage	Cattle damage
8/28/2011	636	Sublette	Removed	NA	Livestock Damage	Cattle damage
8/29/2011	524	Fremont	N.FK. Shoshone River	Park	Livestock Damage	Cattle damage
9/1/2011	423	Park	Calf Creek	Teton	Livestock Damage	Cattle damage
9/1/2011	G174	Fremont	Clarks Fork	Park	Preemptive	Frequenting subdivision
9/11/2011	550	Park	Removed	NA	Livestock Damage	Cattle damage
9/20/2011	G120	Fremont	Removed	NA	Livestock Damage	Cattle damage
9/23/2011	690	Park	Squirrel Ck	Teton	Property Damage	Apple Trees
10/4/2011	692	Park	Blackrock Ck	Teton	Property Damage	Apple Trees

10/7/2011	694	Park	Squirrel Ck	Teton	Preemptive	In Landfill
10/9/2011	337	Park	Squirrel Ck	Teton	Preemptive	In Landfill
10/9/2011	G175	Park	Squirrel Ck	Teton	Preemptive	In Landfill
10/9/2011	G176	Park	Squirrel Ck	Teton	Preemptive	In Landfill
10/10/2011	G177	Park	Squirrel Ck	Teton	Preemptive	In Landfill
10/14/2011	517	Park	Bailey Ck	Teton	Property Damage	Eating oat bales
10/14/2011	G178	Park	Bailey Ck	Teton	Property Damage	Eating oat bales
10/14/2011	G179	Park	Bailey Ck	Teton	Property Damage	Eating oat bales
10/19/2011	465	Park	Clarks Fork	Park	Preemptive	Near Residential Area
10/21/2011	NA	Teton	Removed	NA	Food Reward	At Trailhead and In Campgrounds
10/30/2011	628	Park	Removed	NA	Food Reward	Apple Trees and Pig Feed
11/4/2011	696	Park	Cascade Ck	Teton	Preemptive	Near Ranch Buildings
11/6/2011	666	Fremont	Removed	NA	Food Reward	In Town of Dubois
11/11/2011	552	Park	Cascade Ck	Teton	Preemptive	Near Ranch Buildings
11/11/2011	NA	Park	Removed	NA	Human Injury	Human Attack
11/28/2011	NA	Fremont	On Site	NA	Non-target capture	Released from bobcat trap on site

Wyoming Statute 23-1-1001 requiring notification of grizzly bear relocations reads as follows:

ARTICLE 10
GRIZZLY BEAR RELOCATION

23-1-1001. Grizzly bear relocation.

(a) Upon relocating a grizzly bear or upon receiving notification that a grizzly bear is being relocated, the department shall provide notification to the county sheriff of the county to which the bear is relocated within five (5) days of each grizzly bear relocation and shall issue a press release to the media and sheriff in the county where each grizzly bear is relocated.

(b) The notice and press release shall provide the following information:

(i) The date of the grizzly bear relocation;

(ii) The number of grizzly bears relocated; and

(iii) The location of the grizzly bear relocation, as provided by commission rule and regulation.

(c) No later than January 15 of each year the department shall submit an annual report to the joint travel, recreation, wildlife and cultural resources interim committee. The annual report shall include the total number and relocation area of each grizzly bear relocated during the previous calendar year. The department shall also make available the annual report to the public.

Wyoming Game and Fish Commission, Chapter 58, Notice of Grizzly Bear Relocation Regulation reads as follows:

WYOMING GAME AND FISH COMMISSION
CHAPTER 58,
NOTICE OF GRIZZLY BEAR RELOCATION REGULATION:

Section 1. Authority. This regulation is promulgated by authority of W.S. §23-1-1001.

Section 2. Regulation. The Wyoming Game and Fish Commission hereby adopts the following regulation governing notification to the County Sheriff and the media of grizzly bear relocations in the State of Wyoming. This regulation shall remain in effect until modified or rescinded by the Commission.

Section 3. Definitions. For the purpose of this regulation, definitions shall be as set forth in Title 23, Wyoming Statutes and the Commission also adopts the following definitions:

(a) "County Sheriff" means the County Sheriff's Office in the county where a grizzly bear is relocated.

(b) "Location of the grizzly bear relocation" means the proper name of the drainage in which a grizzly bear is relocated and the estimated number of miles from the relocation site to the nearest municipality, topographical feature or geographic location.

(c) "Provide a press release" means the department shall provide to the County Sheriff and the media in the county in which a grizzly bear is relocated, a press release including the location of the grizzly bear relocation, number of grizzly bears relocated, date of the relocation and the reason the grizzly bear was relocated.

Section 4. Notification of relocation.

(a) Upon relocating a grizzly bear or upon receiving notification that a grizzly bear is being relocated, the department shall notify the County Sheriff of the date, number of grizzly bears relocated, the location of the grizzly bear relocation and the reason of the relocation via direct telephone conversation, written or electronic correspondence, or personal contact within five (5) days of the date of the relocation. The department shall provide a press release to the County Sheriff and the media in the county where a grizzly bear is relocated of the date, number of grizzly bears relocated, the location of the grizzly bear relocation and the reason of the relocation within five (5) days of the date of relocation of any grizzly bear.

Section 5. Savings Clause. If any provision of this regulation is held to be illegal or unconstitutional, such a ruling shall not affect other provisions of this regulation which can be given effect without the illegal or unconstitutional provision; and, to this end the provisions of this regulation are severable.

Conflict Report

Department personnel recorded 219 grizzly bear-human conflicts in 2011. Conflicts are defined as interactions between trophy game animals, people and their property, resulting in damage to pets, livestock or bees, non-natural food rewards, animal caused human injury or death, and human caused injury or death to an animal other than legal hunting or a management action. Five people were injured by grizzly bears in Wyoming in 2011, 4 while hunting and 1 while hiking.

Most grizzly bear-human conflicts in Wyoming are domestic livestock depredations and food rewards from humans in the form of garbage or pet and livestock feed. This trend is a result of grizzly bears increasing in number and distribution into areas used by humans, including livestock production, both on public and private lands. As this growth continues, grizzly bears will search out food sources such as livestock and livestock feed, garbage, and pet food resulting in increased property damage. Conflict prevention is foremost, but conflicts are managed on a case-by-case basis with education, securing the attractants, trapping and relocation or removal, or a combination of methods.

Table 7. Number of grizzly bear-human conflicts in Wyoming - 2011

Aggression Toward Human	0
Human Caused Grizzly Death	7
Human Caused Grizzly Injury	0
Beehive	0
Cattle	71
Garbage	43
Horse	1
Human Death	0
Human Injury	5
Other (Pet/Livestock/Bird Feed)	28
Pet/Guard Animal	1
Poultry	1
Properly Stored Game Meat	0
Property Damage	57
Sheep	5 (49 sheep killed in 5 incidents)
Swine	0
TOTAL	219

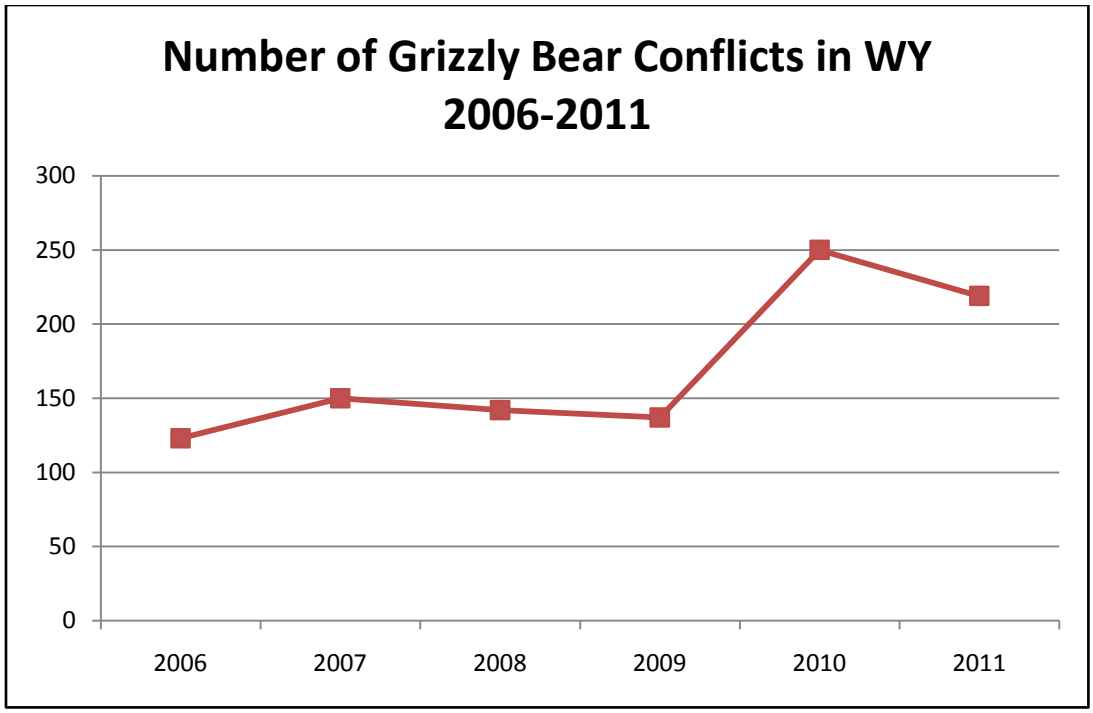

Figure 6. Total number of grizzly bear conflicts in Wyoming from 2006-2011.

Grizzly Bear Mortalities

Within Wyoming, there were 28 known or probable mortalities in 2011. Twenty-five of the mortalities occurred on public land, of which most were on USFS lands.

Types of Mortalities

Management removals accounted for 14 mortalities in 2011. Of the 14 grizzly bears removed in management actions, 6 were removed due to livestock depredations, 7 due to property damage and human food rewards, and 1 after injuring a hunter. In addition to the 14 management removals, 1 grizzly bear was struck and killed by a vehicle, 5 were killed in hunter encounters, 3 were cubs-of-the-year presumed to have died after their mother was killed in a self-defense hunter encounter, 2 were found dead of unknown causes, and the causes of 3 mortalities are undisclosed because they are law enforcement open investigations.

Mortality Trends

With a grizzly bear population expanding in both number and distribution, it is expected that the long-term trend in conflicts and associated removals and mortalities will increase as well (Figure 7). Short-term annual variation in mortalities is a function of natural food trends and conflict histories of individual animals.

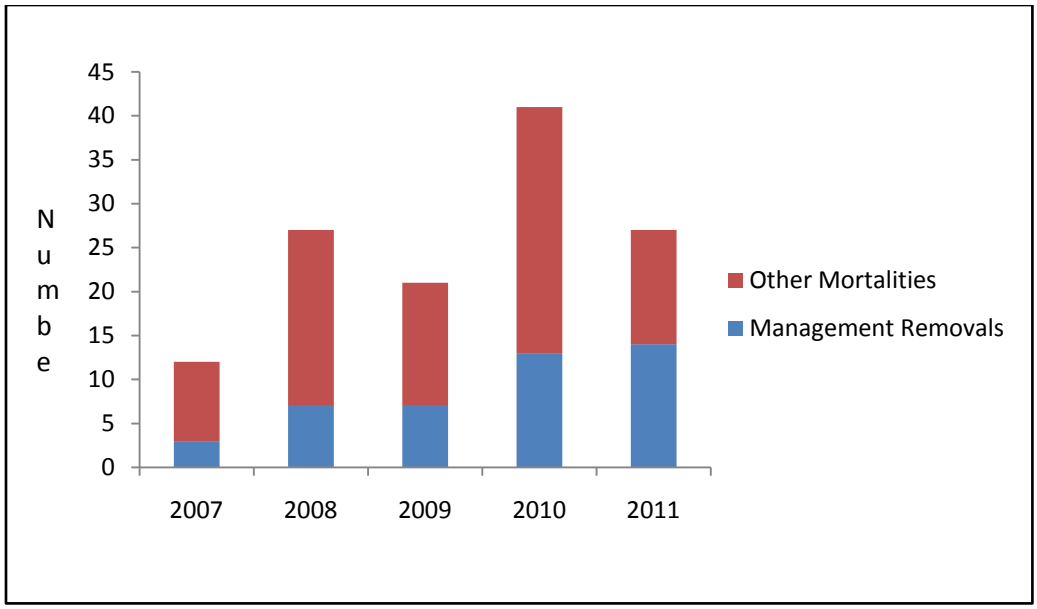

Figure 7. Grizzly bear mortalities by type in Wyoming from 2007-2011.

INFORMATION AND EDUCATION

2011 Bear Wise Community Report

Introduction

The Bear Wise Community Program is a proactive initiative that seeks to minimize human-bear (black and grizzly) conflicts, minimize management-related bear mortalities associated with preventable conflicts, and safeguard human communities in northwest Wyoming. The overall objective of Bear Wise is to promote individual and community ownership of the ever-increasing human-bear conflict issue and eventually, create a social conscience regarding responsible attractant management and behavior in bear habitat. This project seeks to raise awareness and proactively influence local waste management infrastructures with the specific intent of preventing conflicts from recurring. Strategies used to meet the campaign's objectives are: 1) minimize accessibility of unnatural attractants to bears in developed areas; 2) employ a public outreach and education campaign to reduce knowledge gaps about bears and the causes of conflicts; and 3) employ a bear resistant waste management system and promote bear-resistant waste management infrastructure.

This report provides a summary of program accomplishments in 2011. Past accomplishments are reported in the 2006-10 annual reports of the IGBST.

Background

In 2004, a subcommittee of the IGBST conducted an analysis of causes and spatial distribution of grizzly bear mortalities and conflicts in the GYA for the period of 1994–2003. The analysis identified that the majority of known, human-caused grizzly bear mortalities occurred due to agency management actions in response to conflicts (34%), self defense killings, primarily by

big game hunters (20%), and vandal killings (11%). The report made 33 recommendations to reduce human-grizzly bear conflicts and mortalities with focus on 3 actions that could be positively influenced by agency resources and personnel: 1) reduce conflicts at developed sites; 2) reduce self-defense killings; and 3) reduce vandal killings (Servheen et al. 2004).

To address action number 1, the committee recommended that a demonstration area be established to focus proactive, innovative, and enhanced management strategies where developed site conflicts and agency management actions resulting in relocation or removal of grizzly bears had historically been high. Spatial examination of conflicts identified the Wapiti area in northwest Wyoming as having one of the highest concentrations of black bear and grizzly bear conflicts in the GYA. The North Fork of the Shoshone River west of Cody was then chosen as the first area composed primarily of private land to have a multi-agency/public approach to reducing conflicts at developed sites.

In 2005, the Department began implementation of the Bear Wise Community Program. Although the program's efforts were focused primarily in the Wapiti area, the Department initiated a smaller scale project in Teton County to address the increasing number of black and grizzly bear conflicts in the Jackson area. For the last 6 years, the Bear Wise Community Programs in both Cody and Jackson have deployed a multi-facetted education and outreach campaign in an effort to minimize human-bear conflicts and promote proper attractant management. Although a wide array of challenges remain and vary between communities, many accomplishments have been made and progress is expected to continue as Bear Wise efforts gain momentum.

Wapiti Project Update

The Wapiti Bear Wise Community Program continues to utilize radio, television and print media, mass mailings, and the use of signing on private and public land to convey the educational messages surrounding human-bear conflict prevention. Conflict prevention information is also disseminated through public workshops and presentations and by contact with local community groups, governments, the public school system, and various youth organizations. To compliment educational initiatives, the program uses an extensive outreach campaign that assists the community in obtaining and utilizing bear-resistant products and implementing other practical methods of attractant management. Ongoing efforts and new accomplishments for 2011 are as follows:

1. The Carcass Management Program continues to provide a domestic livestock carcass removal service for livestock producers located in occupied grizzly bear habitat within Park County, Wyoming. The program is paid for with funding from the Park County Predator Management District and the Wyoming Animal Damage Management Board. The program provides livestock producers and owners with an alternative to the use of on-site carcass dumps, which are a significant bear attractant and indirectly contribute to numerous human-bear conflicts. Since June 2008, 188 domestic livestock carcasses have been removed from private lands.

2. Recommendations concerning the proper storage of garbage and other attractants are provided to the Park County Planning and Zoning Commission for new developments within the greater Cody area. The Coordinator reviews proposed developments on a case-by-case basis, attends monthly meeting and contacts applicants directly to discuss conflict prevention measures. To date, these comments have been adopted as either formal recommendations or as a condition of approval for 15 new developments within Park County.

3. A traveling Bear Aware educational display was developed and produced for use in public libraries across northwest Wyoming. The display focuses on the prevention of human-bear conflicts and features graphics, an interactive touch screen monitor, short video segments, a grizzly bear hide and skull, and educational materials that are available for check out. The display was featured at the Park County Library in Cody for 8 months and is currently in use at the Sublette County Library in Pinedale.

4. The Wyoming Game and Fish partnership with the North Fork Bear Wise Group continues to grow. The group is comprised of 6 local Wapiti citizens that meet monthly in order to articulate community needs and assist in the development of educational and outreach initiatives.

5. The North Fork Bear Wise Group secured grant funding and purchased 12, 55-gallon bear-resistant grain storage barrels in 2011. The barrels were made available to Wapiti residents for no charge.

6. In 2007 and 2008, 140, 95-gallon bear-resistant garbage carts were purchased with grant funding and offered to the public for the reduced price of $49.99. Because of increased consumer demand and cooperation from local sanitation companies, the remaining inventory of 65 carts were liquidated to local sanitation providers in the Cody area.

7. A “Bear Aware” billboard, “Bear Use Area” highway signs, and educational kiosks remain posted throughout Wapiti and the Crandall/Sunlight area north of Cody. Kiosk message boards are updated three times during the non-denning season with seasonally appropriate conflict prevention information.

8. Bear Aware information continues to be included in "Welcome Wagon" gift bags assembled by local businesses for new residents.

9. Educational black bear/grizzly bear identification materials were distributed to individuals and to local sporting goods stores in the Cody, Pinedale, and Lander areas and mailed to black bear hunters who registered bait sites with the Department in areas surrounding the GYA.

10. Numerous informational presentations were given that focused on human-bear conflict prevention to audiences including the Park County public school system, homeowners associations, Boy Scouts, and the Park County Commissioners. Frequent 1-on-1 contacts were made during the 2011 conflict season in areas where the occurrence of human-bear conflicts has historically been high.

11. A "Working Safely in Bear Country" workshop was conducted for the Park County Weed and Pest District and an educational program was specially designed for employees of local sporting goods stores in the Cody area who routinely have contact with tourists.

12. A public service announcement (PSA) regarding proper attractant management recorded by members of the North Fork Bear Wise Group was broadcast for one week on three local radio stations in the spring of 2011.

13. The Wyoming Game and Fish Department partnered with the Wyoming Chapter of Sportsman for Fish and Wildlife to produce and air a "Hunting in Bear County" public service announcement (PSA). The PSA aired statewide for over two weeks.

14. "Black Bear/Grizzly Bear ID" internet and radio ads were purchased and broadcast in the spring of 2011. The internet ad was featured on the Big Horn Radio Network's home page and contained a link to the bear identification test on the Wyoming Game and Fish Department's website. The radio ads directed black bear hunters to the website and to take the bear identification challenge.

15. A seasonal mailing containing human-bear conflict prevention information and the availability of conflict prevention resources was delivered to residents in targeted areas west of Cody.

Pinedale Area Project Update

In 2011, a small-scale Bear Wise Community effort was initiated targeting residential areas north of Pinedale where the occurrence of human-bear conflict has increased in recent years. Accomplishments for the Pinedale area are as follows:

1. In July of 2010 and 2011, an educational Bear Aware booth was set up and staffed at "Rendezvous Days", a large scale community event in Pinedale that attracts an estimated 10,000 people over a 4-day period.

2. A seasonal mailing containing human-bear conflict prevention information and the availability of conflict prevention resources was delivered to 2 separate residential areas north of Pinedale.

3. An educational presentation was given to a Pinedale area homeowner's association that focused on human-bear conflict prevention measures.

4. An educational Bear Aware booth was set up and staffed at an annual community event in Kendall Valley located north of Pinedale.

The 2012 Bear Wise objectives in Wapiti and Pinedale areas include continued expansion of the program into the other areas of the state where human-bear conflicts continue to be a chronic issue and the continuation of current educational and outreach efforts in the Cody area with specific focus on areas that have not adopted proper attractant management methods.

The Wapiti and Pinedale area Bear Wise Community programs face the ongoing challenges of: 1) the absence of ordinances, regulations, or laws prohibiting the feeding of bears; 2) limited educational opportunities and contact with portions of the community due to a large number of summer-only residents and the lack of organized community groups and; 3) decreased public tolerance for grizzly bears due to record numbers of human-bear conflicts and continued federal legal protection. The future success of the Bear Wise program lies in continued community interest and individual participation in proper attractant management.

Jackson Hole Project Update

The Bear Wise Jackson Hole program continues educational and outreach initiatives in an effort to minimize human-bear conflicts within the community of Jackson and surrounding areas. In 2011, the program's public outreach and educational efforts included the use of signage, public workshops and presentations, distribution of informational pamphlets, promoting awareness about bear spray, and acquiring a bear education trailer. The program's primary focus in 2011, however, was to provide support to Teton County and local waste management companies with the recently adopted Teton County "Bear Conflict Mitigation and Prevention" Land Development Regulation (LDR).

In 2007, Department staff developed a series of recommendations that would require private property owners within Teton County to store garbage and other attractants unavailable to bears. In April 2008, the Teton County Commissioners adopted these recommendations in the form of a LDR. The regulation requires that all residents and businesses within identified high conflict priority areas must store garbage and birdseed unavailable to bears. This regulation was fully implemented in July 2010. Project accomplishments include:

1. A considerable amount of time was spent on public outreach and education projects pertaining to the implementation of the bear conflict mitigation and prevention LDR including: a) informational mailings; b) feature articles in newspapers; c) PSAs; d) radio interviews; e) a full page color newspaper advertisement; and f) routine monitoring for compliance.

2. A bear education trailer was purchased in August 2010 with funding contributions from the Department, Grand Teton National Park, Bridger Teton National Forest and Jackson Hole Wildlife Foundation. Two bear mounts (1 grizzly bear and 1 black bear) have been placed in the trailer along with other educational materials. The bear mounts were donated to the Department through a partnership with the United States Taxidermist Association and the Center for Wildlife Information. The trailer was displayed and staffed at various events and locations including Teton National Park, Old Bills Fun Run, Jackson Farmers Market, Old West Days Parade, Jackson Elk Fest, and National Elk Refuge Visitor Center.

3. One hundred and seventy cans of bear spray were purchased with funding from a community foundation grant in cooperation with the Jackson Hole Wildlife Foundation. The bear spray was distributed, free of charge, to people recreating in occupied grizzly bear habitat in the Jackson Region by Department staff during the 2010 and 2011 hunting seasons. The purpose of the free give-away was to help hunters become familiar with bear spray and to help create a social norm encouraging hunters to carry spray.

4. Public service announcements were broadcast on 4 local radio stations in Jackson for a total of 8 weeks throughout the spring, summer, and fall of 2011. The announcements focused on storing attractants so they are unavailable to bears, hunting safely in bear country, and bear species identification.

5. Numerous educational talks were presented to various groups including homeowner's associations, guest ranches, youth camps, Jackson residents, tourists, and school groups.

6. Spanish language bear informational pamphlets were distributed to Spanish speaking residents in Teton County with the help of the Teton County Latino Resource Center, Teton Literacy Center, and the Jackson Visitor Center.

7. Bear educational posters were placed for a third year inside of Jackson's public buses.

8. Restroom posters with information about attractant storage were placed in 16 different restaurants in Teton County for a 6-month period.

9. Refrigerator magnets featuring tips about proper attractant management were distributed to Teton Village homeowners and Jackson Hole Mountain Resort lodging.

10. Numerous personal contacts were made with private residents in Teton County. This has proven to be a useful way to establish working relationships with residents and maintain an exchange of information about bear activity in the area.

11. A booth containing information on bear identification, attractant storage, hunting and recreating safely in bear country, and the proper use of bear spray was staffed at the Jackson Hole Antler Auction.

12. Assisted 3 hunting outfitters and Jackson Hole Mountain Resort with the installation and maintenance of electric fence systems around their field camps located in the Bridger-Teton National Forest.

13. Signage detailing information on hunting safely in bear country, bear identification, recent bear activity, and proper attractant storage were placed at USFS trailheads and in private residential areas throughout Teton County.

14. Consultations were conducted at multiple businesses and residences where recommendations were made regarding sanitation infrastructure and compliance with the Bear Conflict Mitigation and Prevention LDR.

15. Bear Aware educational materials were distributed to campground hosts in the Caribou-Targhee National Forest, hunters, and numerous residents in Teton County.

16. Several radio and newspaper interviews were conducted regarding grizzly bear range expansion and conflict prevention in the Jackson area.

17. Educational black bear/grizzly bear identification materials were distributed to black bear hunters who registered bait sites with the Wyoming Game and Fish Department in the Jackson region.

Objectives for the Bear Wise Jackson Hole program in 2012 will again be focused on supporting Teton County and local waste management companies with projects that will help disseminate information and achieve compliance with the recently adopted Teton County Bear Conflict Mitigation and Prevention LDR. In addition, more work will be done to identify areas within the city limits of Jackson and Star Valley communities where better attractant management and sanitation infrastructure is needed.

The recent implementation of the Teton County Bear Conflict Mitigation and Prevention LDR has greatly reduced the amount of available attractants on the landscape and is a tremendous step forward for the Bear Wise Jackson Hole program. The new challenges faced by the Department will be achieving full compliance with this regulation, even in years with low conflict when it may appear that the conflict issue is resolved. The Bear Wise Jackson Hole Program will convey the importance of compliance and strive to maintain public support for the LDR through public outreach and education projects. In order for the Jackson program to be successful, the program must continually identify information and education needs within the community while being adaptive to changing situations across different geographic areas. This will require the Department to coordinate with other government agencies and local non-government organizations working across multiple jurisdictions to develop a uniform and consistent message. If this level of coordination is achieved, the Department will be more effective in gaining support and building enthusiasm for Bear Wise Jackson Hole, directing resources to priority areas, and reaching all demographics.

Information and Education Report

2011 Accomplishments

1) Electronic and Print Media

   a) Department personnel issued approximately 15 news releases throughout the season informing readers and listeners of bear safety, behavior, conflict avoidance, food storage and natural food shortages. In addition, 16 relocation notifications were distributed as required by state statute.

   b) Multiple public service announcements (some were paid) addressing bear activity, bear identification, food storage, and hunting safely in bear country were aired in communities surrounding the GYE. Virtually every news release sent out on bears is also issued in a weekly radio spot through the Department headquarters information branch.

2) Conservation Education

   a) The Department conducted approximately 50 individual public programs and presentations in an effort to increase understanding and knowledge of bears, bear behavior, and conflict avoidance. These efforts included presenting 11 "Staying Safe in Bear, Lion, and Wolf Country" seminars (291 attendees) and the annual Hunting and Fishing Heritage Exposition Bear Trail Exhibit (1800 participants). Many of the programs were presented to school groups, conservation organizations, conservation camps, hunter education courses, property owners, field workers, and recreationists.

   b) For the second year in a row, we provided bear safety and food storage information to each new Boy Scout troop who spent time at Camp Buffalo Bill, a nationally attended summer Boy Scout facility west of Cody. Over 2,000 scouts and leaders passed through the facility in 2011 and the Department program was part of their orientation to the camp.

3) Hunter Education

   a) Every hunter education class in Wyoming is required to discuss how to hunt safely in bear country. To assist instructors, most have been provided inert bear spray canisters for demonstration purposes and DVD's entitled "Staying Safe in Bear Country" and "A Behavioral Based Approach to Reducing Risk." A section on bear safety is also included in the student manual.

   b) On an annual basis, newly certified hunter education instructors are trained by Department personnel in techniques used to prevent encounters while hunting in bear country and the proper use of bear spray. Inert bear spray canisters are used to

demonstrate the proper use of bear spray at the New Instructor Hunter Education Academy in Dubois and are distributed directly to volunteer instructors at annual Hunter Education Instructor workshops held around the state.

4) Grizzly Bear Management Web Page

a) The grizzly bear management web page continues to be maintained and updated on a regular basis in order to provide timely information to the public regarding grizzly bear management activities conducted by the Department. Web page contents include various interagency annual reports and updates and links to other grizzly bear recovery web sites.

b) Beginning in April, weekly updates of ongoing management activities related to depredations, research, trapping and monitoring, and information and education were posted to the Department's website. A total of 29 weekly updates were posted for the weeks of April 30 to November 18.

c) As per Wyoming Statute, grizzly bear relocation from one county to another must be announced through local media and to the local Sheriff of the county into which the bear was relocated. Each announcement is posted in a timely fashion to the web page. In 2011, 16 notifications were distributed and posted on the website.

5) Collaborative Projects with the Center for Wildlife Information

a) Hunting in Bear Country tip sheets were developed and obtained through the Center for Wildlife Information.

b) Tip Sheets were mailed out to big game license holders in grizzly bear areas in an effort to reduce hunter-bear conflicts.

6) FY11 Conservation Strategy Funding Update

a) The Department used $4,000 to purchase 500 inert bear spray training canisters for use in Hunter Education programs and other bear-related educational programs. Counter Assault sold inert canisters for $4.36 less than their cost per can for a total of $2,230.00 in savings to the Department.

b) The Department used $1,450.00 to purchase *Be Bear Aware* children's coloring books from the Center for Wildlife Information.

The Department used $1,500.00 to purchase 2 weeks of statewide airtime for 2, Hunting in Bear Country PSAs. The Cowboy State News Network provided a 50:50 match for airtime purchased and Sportsman for Fish and Wildlife paid for $500.00 of airtime.

Publications

The primary link to other publications, annual reports, and peer-reviewed literature for the GYE population of grizzly bears is summarized on the United States Geological Service website at http://www.nrmsc.usgs.gov/products/IGBST